F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

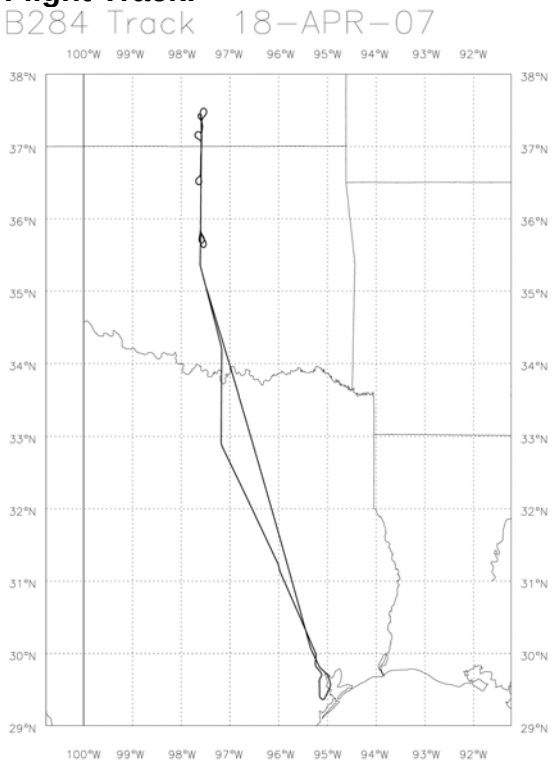
Flight No.:	B284
Date:	18 April 2007
Take Off	24:34:47
Landing:	30:17:55
Flight Time	5h43m08

Campaign: IASI - ARIES

Operating Area: Ellington - Oklahoma

POB	Position	Name	Institute
1	Captain	Alan Roberts	Directflight
2	Co-pilot	Ian Ramsay-Rae	Directflight
3	CCM	Gaynor Ottaway	Directflight
4	Mission Scientist 1	Jonathan Taylor	Met Office
5	Flight Manager	Jamie Trembath	FAAM
6	Cloud Physics	Paul James	FAAM
7	Core Chem / AVAPS	Doug Anderson	FAAM
9	ARIES	Joss Kent	Met Office
10	MARSS	Chawn Harlow	Met Office
11	AMS	Will Morgan	University of Manchester
12	Wet Neph	Dave Tiddeman	Met Office
13	Mission Scientist 2	Alessio Bozzo	University of Bologna
14			
15			
16			
17			
18			
19			
20			

Flight Track:

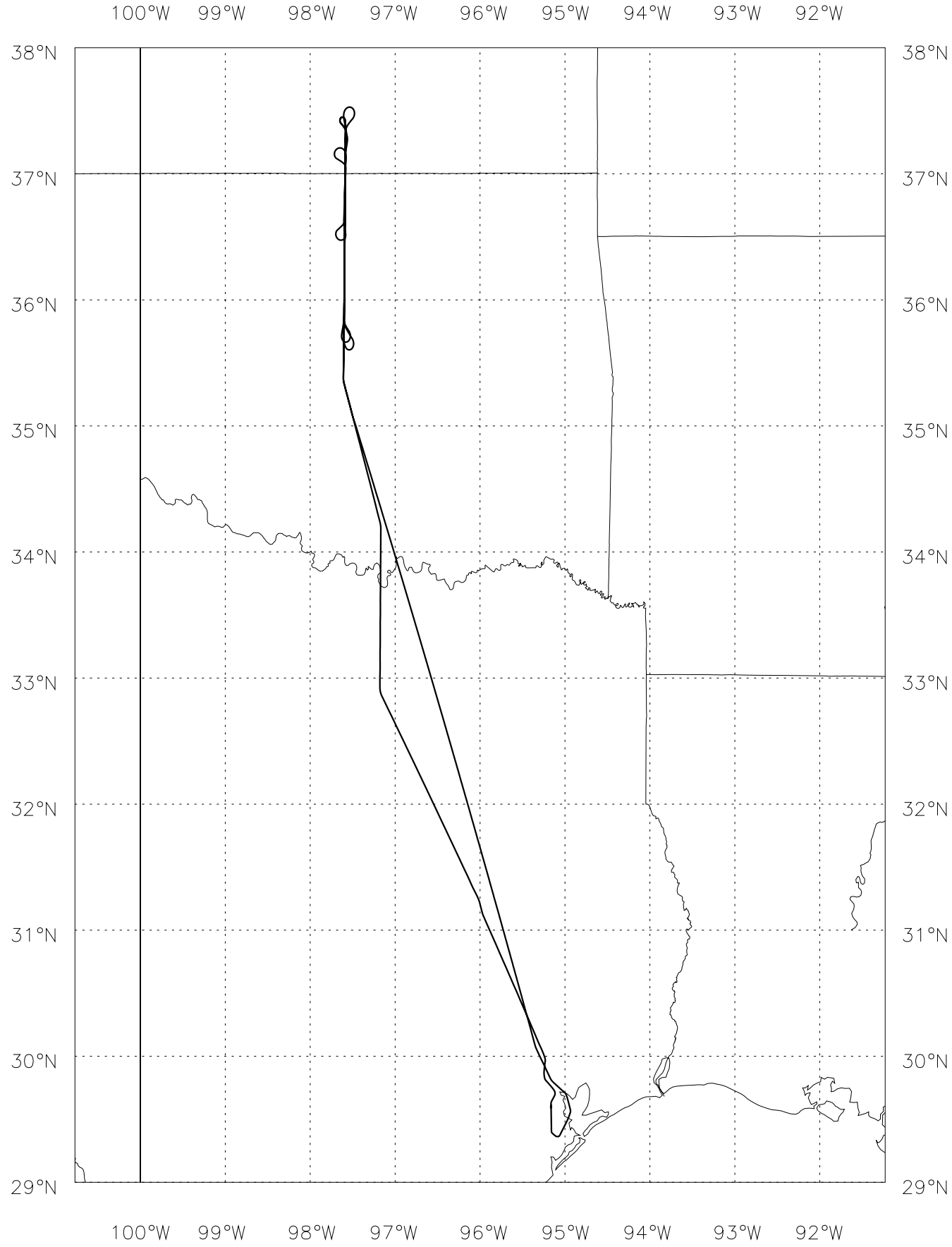


FLIGHT SUMMARY

Flight No B284
Date: 18/19th April 2007
Project: IASI
Location: Metop overpass, ARM site Oklahoma

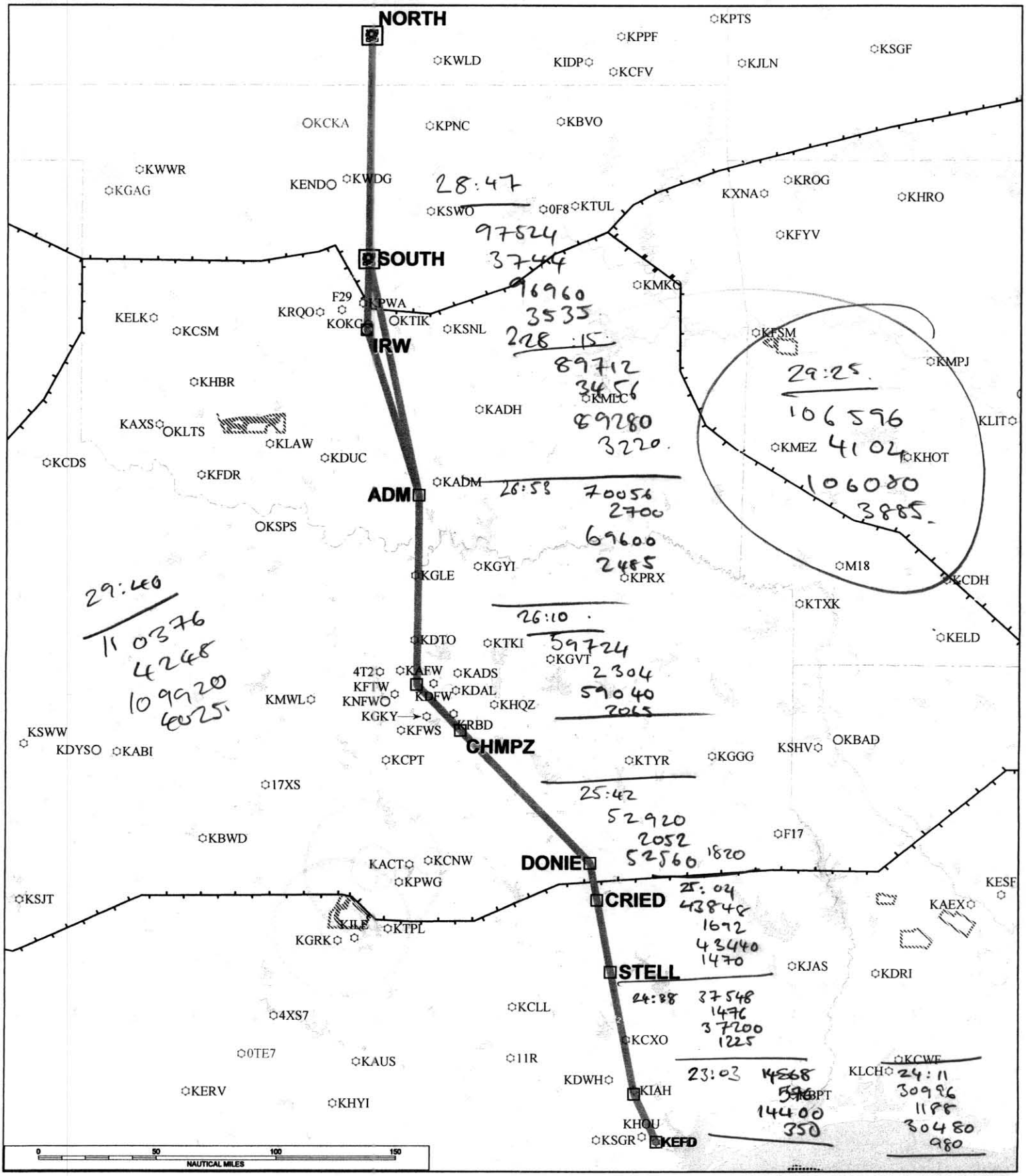
Start Time	End Time	Event	Height (s)	Hdg	Comments
230130		Start-Up	0.11 kft	178	29'36.05N 95'10.06
242820		ASP	0.08 kft	026	open
243447		T/O	0.90 kft	031	
254436	254859	Profile 1	24.0 - 20.0 kft	333	
255005	260549	Profile 1	20.0 - 4.1 kft	335	point SOUTH
255041		QNH	19.6 kft	336	1012
260549	262918	Run 1	4.1 kft	003	point SOUTH to point NORTH
263221	264410	Profile 2	4.1 - 15.1 kft	166	interrupt
264859	265021	Profile 2	15.1 - 16.1 kft	345	interrupt
265047	265511	Profile 2	16.1 - 20.0 kft	357	interrupt
265921	270848	Profile 2	20.0 - 28.0 kft	173	
270859	271406	Run 2.1	28.0 kft	193	
271849	273735	Run 2.2	28.0 kft	349	
272010		Sonde 1	28.0 kft	350	Point SOUTH
272511		Sonde 2	28.0 kft	349	
272811		Sonde 3	28.0 kft	348	
273100		Sonde 4	28.0 kft	348	
273312		Sonde 5	28.0 kft	351	
274151	275912	Run 3	29.0 kft	178	
274151		Sonde 6	29.0 kft	178	
274406		Sonde 7	29.0 kft	203	
274700		Sonde 8	29.0 kft	195	
275000		Sonde 9	29.0 kft	193	
275301		Sonde 10	29.0 kft	192	
275600		Sonde 11	29.0 kft	192	
280317	282356	Profile 3	29.0 - 4.0 kft	001	point SOUTH to point NORTH
282712	285427	Run 4	4.0 - 4.1 kft	181	point NORTH to point SOUTH
301755		Land	0.08 kft		
302309		ASP	0.08 kft	359	Closed
302444		Shutdown	0.08 kft	359	29'36.06 N 95'10.06W

B284 Track 18-APR-07



KEFD -> KHOU - Overview
NavData Cycle 2007-3 Expired: Thursday, 12 April 2007.
Scale: 1:3871035 (1 inch = 53.09 naut mi). Printed on 18 Apr 2007

JEPPESEN
FliteStar 9.170



errors 4 & 22

Sortie Brief – Oklahoma

Flight B284 **Wed 18th April 2007**
Mission Scientist: Jonathan Taylor

Briefing: 1730L 2230Z
Take off: 1930L 0030Z
Land: 0100L 0600Z

Satellite overpass = 03:35Z

Aim: To underfly IASI on the Metop satellite in the vicinity of the ARM site coordinated with the overpass.

Location: Over ARM instrument site located near Lamont, Oklahoma.

Weather conditions: Clear skies or Broken cloud.

Key instruments: ARIES, MARSS, SWS, AVAPS, Core Chem, Cloud Phys

Fixed Points: BAe 146 to follow fixed ground positions as follows:

Over OKLAHOMA
Fixed point STH: (35°50' N, 97°36' W)
Fixed point NTH: (37°20'N, 97° 35'W)

1. Take off from Houston and transit to Oklahoma point STH to arrive at 4000ft (90 mins)
2. SLR from STH to NTH at 4000ft (25 mins)
3. Profile from NTH to STH from 4000ft to FL280 (30 mins)
4. SLR from STH to NTH at FL280 (20mins)
5. SLR from NTH to STH at FL280 (20mins) overpass occurs during this run
6. Profile from STH to NTH from FL280 to 4000ft (30mins)
7. SLR from NTH to STH at 4000ft (25mins)
8. Transit back to Houston (90mins)

Drop sonde pattern: aim is to launch sondes with good coverage along the sub-satellite track with particular density at the overpass time.

Satellite overpass – 03:35Z

Dropsonde launch:	Time Z	Time relative to overpass (mins)
#1	0325	T-10
#2	0328	T-7
#3	0331	T-4
#4	0333	T-2
#5	0341	T+6
#6	0344	T+9

Plus 4 more sondes spread evenly during other high level run.

ARIES operations

During 1st low level run, mainly NADIR with short ZEN view
During overpass run all NADIR
During other high level run mainly NADIR with short Zenith
During 2nd low level run mix of NADIR and ZEN

Sortie Brief – Oklahoma

Flight B284 **Wed 18th April 2007**

Mission Scientist: Jonathan Taylor

Briefing: 1730L 2230Z
Take off: 1930L 0030Z
Land: 0100L 0600Z

PLOT HIGMAN V ALT. flow light on PSAP not on @ on when flow is

Satellite overpass = 03:35Z h_AVAPS_SND.

Aim: To underfly IASI on the Metop satellite in the vicinity of the ARM site coordinated with the overpass.

Location: Over ARM instrument site located near Lamont, Oklahoma. 101R

Weather conditions: Clear skies or Broken cloud. run 3.

Key instruments: ARIES, MARSS, SWS, AVAPS, Core Chem, Cloud Phys

Fixed Points: BAe 146 to follow fixed ground positions as follows:

JT says no ↑

Over OKLAHOMA
Fixed point STH: (35°50' N, 97°36' W)
Fixed point NTH: (37°20'N, 97° 35'W)

run 3 27:41:51

1. Take off from Houston and transit to Oklahoma point STH to arrive at 4000ft (90 mins)
2. SLR from STH to NTH at 4000ft (25 mins)
3. Profile from NTH to STH from 4000ft to FL280 (30 mins)
4. SLR from STH to NTH at FL280 (20mins)
5. SLR from NTH to STH at FL280 (20mins) overpass occurs during this run
6. Profile from STH to NTH from FL280 to 4000ft (30mins)
7. SLR from NTH to STH at 4000ft (25mins)
8. Transit back to Houston (90mins)

10 8 6 4 2 0

7.5 6.7 5.7 4.5 3.6 2.6 1.5 0.6 - 0.47

Sonde 8.

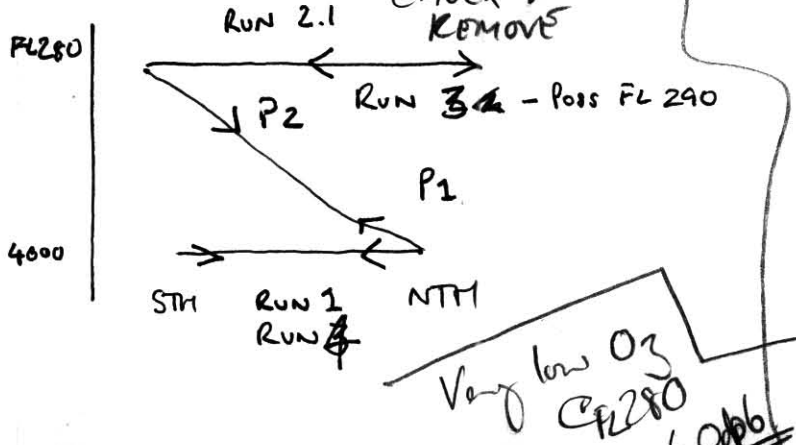
Check Sonde #s

T/O → 24:34:47
LAND → 30:17:55

20:08:40 no hunks available @ this time

CAP @ 10,000 ft.

LOOKS LIKE SONDE 7 IS THE ADDED ONE CHECK & REMOVE



Very low O3 @ FL280 6.0ppb

Heiman & Aires show diff surface temp →
BBar 8 - 10μm
Sensitive to atmosphere above which is colder
Aries 2565 super wavelength

Aircraft Scientist's Log

J. TAYLOR

Flight No **B** 284 Date 18/4/07 Page 1 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					Flat cloud tops ~5000ft.
					3/8 Ci overhead.
25[illegible]0					8/8 Sc below. v. thin strip of Ci
					ahead otherwise clear above.
24 5400					Steady at FL240. cloud breaking
					below and ahead.
2507 18					Still clear above clear below but
					broken Sc ahead.
251303		FL240			cloud breaking below. still clear
					above.
253501		FL240			Clear above clear sharply below
					and ahead broken Sc to. West.
256536	P1	FL240↓	334		Stop P1 from FL240 to 4000ft
					at Point South
					clear above + below.
254859	P1	FL200	335		Interrupt P1 for air traffic.
014859					
255005	P1	FL204	336		Restart P1 2/16 acpt QNH 1012
015005					clear skies above + below
					Reduce ↑ to 800/c PLASP.
					Now in moist hazy layer but
					remain cloud free below + above
260549	P1/U1	4000ft	003	POINT STH.	Ends P1 + start U1.1 QNH 1012
020549					ARIES NADIR 266kn⁻¹ = ~~280~~ 285K
					Totally cloud free !!

Aircraft Scientist's Log

Flight No B.286..... Date ....18/6/07..... Page 2 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
261[illegible]					Upw Bgrnd= 387 w/m⁻²
261[illegible]					Passed pt C - ARM site.
262338	R1	4000ft	004		QNH 1014mb. cloud free at
					all levels.
					PCASP ≈ 650cm⁻³
262918	R1	4000ft	003		End Run1 at Point NE.
022918					
263221	P2↑	4000ft↑	180		Strt P2↑ 4000ft
023221					
263656					Bkwy. 7660ft PCASP down to
					slight turbulence at 1000/cc
					bkwy leg
263952					at ARM site
264410	P2	15000ft	180		Intercept P2 QNH 1011mb
024410					
264859	P2	15000ft↑	346		Restart P2↑
024859					
265021	P2	16000ft			Intercept P2 @ 16000ft QNH 1011 mb
025021					
265059	P2	16000ft P2↑	356		Restart P2 Totally clear.
025059					
265511	P2	FL200	356.		Intercept P2
025511					
265921	P2	FL200↑	170		Restart P2
025921					

Aircraft Scientist's Log

J. Taylor

Flight No **B** 286 Date 18/4/09 Page 3 of 5

FAAM © 2004

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					W1557 is running later 70nm South.
270848	P2	FC280	193		Early P2 + Start Run 2.2
030848	R2.1				
	R2.1	FC280	193		End R2.1
271849	R2.2	FC280	352		St Run 2.2 Just 7nm South of
021849					PF South.
272009		FC280	349		Drop sonde 1.
032010					T=-36.38 Td=-55.15
					286/33ms⁻¹.
272511		FC280	348		Dropsonde 2 -36.27/-55.16°C
032511					P=329mb 287/3ms⁻¹
					2616cm⁻¹ = 287K
					Herman = 5.43 278K
272811		FC280	347		Dropsonde 3 -36.89/-55.39
032811					wind 35ms⁻¹/285deg. 328mb.
273100		FC280	348		Dropsonde 4 -37.81/-55.71
033100					35ms⁻¹/287deg P=328mb
273312		FC280	357		Dropsonde 5 -38.09 -55.4
033312					30ms⁻¹/293 Po: 328.
					Climbing to FC290

Aircraft Scientist's Log

S. Taylor

Flight No B 284   Date 18/4/07   Page 4 of 5

FAAM © 2004

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
274451 034451	R3	FL290	174		Dropsonde 6 −40/−52.88. + Starting Run 3-1 Heading South
					34 m.s⁻¹ / 285 deg P = 31 kmb
274334					slight Leading convection
274406 034406	R3	FL290	203		Dropsonde 7 −40.3/−51.89 34 m.s⁻¹ / 281 dge P = 31 kmb
274700 034700	R3	FL290	195	Lots of static on dropsonde!	Dropsonde 8 −39.8/−56.04 37 m.s⁻¹ / 278 P = 31K
274958 034958	R3	FL290	194		Dropsonde 9 −39.1/−57.37 36/277 31 kmb
275300 035300	R3	FL290	194		Dropsonde 10 −38.8/−57.37 35/276° 31 kmb
275600 035600	R3	FL290	192		Dropsonde 11. −38.7/−56.67 35/270° 31 kmb
275912 035912	R3	FL290			Ending Run 3 at FL290.

Note: T, Td + wind data recorded by AVAPS manually after launch [illegible]

Aircraft Scientist's Log

J. Taylor

Flight No **B**...284... Date ...18/6/09... Page 5 of 5

FAAM © 2004

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
280317	P3↓	FL290	000		Start P3 ↓ run Sth
040317					
					Still cloud free.
280356	P3	4000ft	004		Early P3 P=1012mb
040356					At Nth point
					turning to run South @ 4000ft
					11.1°C / 5.0°C Td.
					P=873mb
280712	R4	4000ft	178		Str R4 run Nth to Sth
040712					
					Ozone data all looks Rubbish!
					PCASP = 650cm⁻³
285627	R4	4000ft	178		Early R4 at Sth point.
045627					
					climbing to recover to Ellington.

CLOUD PHYSICS LOG Flight B 284

Date: 18/4//07	Operator: papj	DRS Time: 08:00:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 1 of 1

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
14436	15	0.09															P1
254859	30	0.09															200
255550	60	0.09															150
260048	150	0.09															100
260229	90	0.08															080
260455	800	0.09															050
260549	600	0.09															040 end p1
260948	600	0.09															Start run 1
0214	600	0.09															
0218	600	0.09															
0222	600	0.09															
0226	600	0.09															
022918	600	0.09															End run
023221	450	0.09															P2
23650	50	0.09															075
23910	40	0.09															100
24410	60	0.07															150
25514	10	0.06															200
30851	10	0.07															End p2
032000	10	0.09															
0440	650	0.09															040
0443	650	0.09															
0451	650	0.09															
045427																	end

CLOUD PHYSICS PROCESSING LOG

Flight number: **B284** **T/O:** 243447
Date of flight: 18/4/07 **Land:** 301755

A) FFSSP PROCESSING		
Processing Stage	Done?	Comments
1) Transfer *.txt files from DVD to processing PC		
Bnnn_FFSSP_hh.txt for each hour of data	NO	**hh =**
Bnnn_FFSSP_HVMS.txt		**Last sec processed =**
2) FTP the files (ascii) from the PC to directory PMSDATA: on FLOODS		**File size =**
3) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FSSP_EXTRACT_TAS**		Use time just before/after take-off/landing. If T/O /landing just after/before the hour, ensure start/end time is before/after the hour if there is an FFSSP_hh.txt file for that hour.
a) Flight number: **Bnnn**		
b) Path name: **MFDDATA:Bnnn_MFDX**		
c) Output directory: **PMSDATA:**		
d) Start time: *0 if unknown (see comment box)*		
e) End time: *240000 if unknown*		
4) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FFSSP_PROCESS_TXT**		
a) Flight number: **Bnnn**		
b) Directory: **PMSDATA:**		**Total glitches =**
c) TAS in processing: **Y**		**Sec file written ok?**
d) Vel threshold (clicks) **0**		
e) Calibration file: *Use the most recent calibration file.* Format FFSSP_CALddmmyyyy.txt Calibration files to be stored in MRFB:[PMS.FAST_FSSP]		**Note calibration file used**
f) Adjust FFSSP time **Y/N**		Yes only if gross errors occur in FFSSP time eg; ~ 1hour
g) If Y, enter value to add to data time (seconds)		
5) FLOODS> **WAVE**		Use PVWAVE for this section
a) WAVE> **write_procffssp_to_m5,'pmsdata:Bnnn_procffssp.dat', 'mfddata:Bnnn_mfdX','pmsdata:Bnnn_m5procffssp',/auto**		**Note time correction applied to FFSSP by /auto =**
b) WAVE> **exit**		
6) FLOODS> **MODIFY**		
a) Modifying datasets: **pmsdata:Bnnn_m5procffssp**		**Input file size =**
b) Dataset: **mfddata:Bnnn_mfdX**		**M5 output file size =**
c) New dataset: **mfddata:Bnnn_mfdY (y=x+1)**		
d) Parameter description file: *leave blank to use default*		
7) CHECKS:		
i). Are FFSSP and JW/Nevzorov LWC synchronized in time? *In flight_plot, parameters* *JW LWC para 535* *Nevzorov LWC para 602* *FFSSP LWC para 1202*		**Synchronized?**
ii). If not, repeat from step 5b replacing /auto with **addt=x** which adds x+20 secs to FFSSP time.		

CLOUD PHYSICS PROCESSING LOG

Flight number: **B284** **T/O:** 243447 = 003447
Date of flight: 18/4/07 **Land:** 301755 = 061755

B) 2D PROCESSING		REPROCESS +1hr
Processing Stage	Done?	Comments
1) Transfer Bnnn.dat file from CD/DVD to PC	Y	
2) Zip up file on PC (Bnnn.zip)	Y	
3) FTP the zipped file (binary) from the PC to the directory SEADAS_DATA:[SEADAS_DATA] on FLOODS	y	Via BADC
4) Log on to FLOODS		
5) Unzip SEADAS_DATA:[SEADAS_DATA]Bnnn.zip	y	**Size of Bnnn.dat =**
6) FLOODS> **WAVE**		Use PVWAVE for this section
WAVE> **CONVERT_SEADAS_FILE** a) Input file: **SEADAS_DATA:[SEADAS_DATA]Bnnn.dat** b) Output file: **SEADAS_DATA:[SEADAS_DATA]Bnnn_seadas.dat** WAVE> **exit**		**Blocks read = 47373** **Blocks written = 47373** **Bad reads =0**
7) FLOODS> **RUN MRFB:[PMS.SEADAS]READM200_FILE**		
a) Default directory: **PMSDATA:** b) Flight number: **Bnnn** c) Disk file name: **SEADAS_DATA:[SEADAS_DATA] Bnnn_seadas.dat** d) Comment string: e) Start time: *0 if unknown (T/O – 5 min)* f) End time: *240000 if unknown (Land + 5 min)* g) Read 2DC: **Y** h) Read 2DP: **Y** i) Secondary data: **Y** j) FSP-SYNC: Y k) cmd.str: **Y** l) Auto time correction: **N** m) Full length secondary:**N**	 y	 **Start = 003400** **End = 061800** Ignore error message scroll (vestigial error from tapes) **Are FRW, FSP, IMB, PCA,SEC files in PMSDATA?** **Are they non-zero in size?**
8) FLOODS> **WAVE**	No Cloud	2D image display and printing
i). WAVE> **imagedisplay** a) 2D directory name: **PMSDATA:** b) Flight number: **Bnnn** c) Time from IWC plot: **N** d) Select probe: (**1**) 2DC (**2**) 2DP e) Start time: *As in 7e above* f) End time: *As in 7f above* g) Time interval (sec): **5** recommended (0 for all images) ii). WAVE> **auto_image** a) 2D directory name: **PMSDATA:** b) Flight number: **Bnnn** c) Enter date: **YYYYMMDD** d) Enter start time: *0 if unknown (T/O – 1 min)* e) Enter end time: *240000 if unknown (Land – 1 min)* f) Enter time interval (sec) between successive imaged blocks: **10** iii). WAVE> **exit** to create files iv). FTP ascii *.PS files from PMSDATA: to PC v). Load each into Ghostview or other pdf-converter vi). Output as pdf file (720 dpi resolution), appending name prefix of	n	Must be done from FLOODS itself. **Note any problems with images** Prepare imagery for Core data From own PC again **Start =** **End =** FAAM_YYYYMMDD_R0_ Bnnn_2Dx-images.ps Notes on this in instructions

CORE-CLOUD-PHY_ to converted files		
9) FLOODS> **RUN MRFB:[PMS.SPEC2D.AUTO]PROCESS2D_AUTO** a) Flight number: **Bnnn** b) Directory: **PMSDATA:** c) File generation: *Hit enter* d) Time correction: *Time offset of the 2D data* e) TAS: **Y** f) MFD directory: **MFDDATA:Bnnn_MFDX** g) Probe number: (**1**) 2DC (**2**) 2DP (**0**) Both *0 unless either probe known to be faulty* h) Start time: *0 if unknown (T/O + 30sec)* i) End time: *240000 if unknown (Land – 30sec)* j) Nominal averaging: **0.2** seconds for conversion to M5 k) Particle type 2DC: **8** if known to be in ice cloud **11** if known to be in water cloud l) Particle type 2DP: **8** if known to be in mixed-phase **8** if unknown m) Coefficient choice: **2** n) Output root filename: **PMSDATA:Bnnn_PROC2D**	n	NB. an error message may appear, floating point exception, rerun and use time quoted in error message, repeat until successful. **X =** **Start =** **End =** **Time data processed to =** **2dproc files present?** *.2dc, *.2dp and *.dat
10) FLOODS> **WAVE** i) WAVE> **WRITE_PROC2D_TO_M5, 'PMSDATA:BNNN_PROC2D.DAT', 'PMSDATA:BNNN_M5PROC2D'** ii). **exit**	**n**	Use PVWAVE for this section Error message about HDDR file should be ignored. **Records =**
11) FLOODS> **MODIFY** a) Modifying datasets: **pmsdata:Bnnn_m5proc2D** b) Datset: **mfddata:Bnnn_mfdX** c) New dataset: **mfddata:Bnnn_mfdY** d) Parameter description file: leave blank to use default	**N**	**X =** **Y = (X+1)**
12) CHECKS: Are 2DC/2DP IWC of comparable magnitude and well-correlated with Nevzorov TWC? *In flight_plot, parameters* *Nevzerov TWC para 605* *2DC IWC para 1302* *2DP IWC para 1312*	**n**	**Correlated?**

CLOUD PHYSICS PROCESSING LOG

Flight number: **B284** **T/O:** 243447 = 003447
Date of flight: 18/4/07 **Land:** 301755 = 061755

C) PCASP PROCESSING		
Processing Stage	Done?	Comments
1) Complete stage 7) in 2D processing Ensures Bnnn_FSP.DAT containing raw PCASP data is written to directory PMSDATA:	y	
2) FLOODS> **RUN MRFB:[PMS.PCASP]PROCPCASP_NEW** a) Flight number: **Bnnn** b) File name: **PMSDATA:Bnnn_FSP.DAT** c) Root output name: **PMSDATA:Bnnn_PROCPCASP** Produces PMSDATA:Bnnn_PROCPCASP.DAT (binary) PMSDATA:Bnnn_PROCPCASP.OUT (ascii) d) Minimum size channel: *default = 1* *If smallest size channel are known to be noisy the value of the highest noise free channel to be entered here* e) Calibration volume flow rate: *Use the most recent value. 1.8ccs^{-1}* *Calibration files to be stored in **Exeter*** *Entering zero gives default value = 1.0 cm^{3}s^{-1}* f) Time correction: *Same value as used in 2D processing stage 9d* g) Start time: *0 if unknown* h) End time: *240000 if unknown*		**Min size = 1** **Vol flow rate =** 1.0
3) FLOODS> **WAVE**		Use PVWAVE for this section
i).WAVE> **write_procpcasp_to_m5, 'pmsdata:Bnnn_procpcasp.dat', 'pmsdata:Bnnn_m5procpcasp'** ii). WAVE> **exit**		
4) FLOODS> **MODIFY** a) Modifying datasets: **pmsdata:Bnnn_m5procpcasp** b) Dataset: **mfddata:Bnnn_mfdX** c) New dataset: **mfddata:Bnnn_mfdY** d) Parameter description file: *leave blank to use default*	n	Data not added to mfda **Seadas time 0035h – 0618h** **Horace time 2200 h- 3029h**
5) CHECKS Are PCASP and NEPH peaks synchronous? *In flight_plot, parameters* *Neph total blue scatter* *PCASP conc para 1550*	**n**	

FAAM Dropsonde Flight Log

Flight No.	B284	Date	18-19 Apr 2007 (sondes launched on 19th, Z time)
Page No.	1 of 1	Operator	Doug Anderson

GMT	Sonde No.	Event	Comments
		e.g. launch, splashdown	*e.g. wind data? PTH data? Lat/Long* *NB strings of dropsonde data contain:* *time, pressure hPa, T deg C, RH %, wind direction deg, wind speed m/s, longitude, latitude, height m*
03:20:12	1	Launch	330.64 -14.64 0.68 297.93 32.57 -0.01 **-97.599199 35.832952**
03:30:10	1	land	**-97.535085 35.822027**
03:26:59	2	Launch	420.04 -22.79 3.33 292.75 19.60 -15.35 **-97.561204 36.253921**
03:35:22	2	land	**-97.528354 36.251668**
03:28:15	3	Launch	129.03 99.00 46.02 206.68 61.29 -0.01 **-97.592633 36.517287**
03:34:18	3	land	**-97.553539 36.511932** (last reading at 03:33:41)
03:31:03	4	Launch	9999.00 99.00 999.00 193.20 107.28 -0.02 **-97.589183 36.761544**
03:41:04	4	land	972.50 17.17 59.96 269.65 5.29 -0.81 **-97.535071 36.756148**
03:33:14	5	Launch	**-97.586723 36.953162**
03:43:28	5	land	**-97.536115 36.947727**
03:41:52	6	Launch	315.46 -12.96 1.09 292.65 40.91 0.17 **-97.599275 37.425568**
03:50:36	6	land	**-97.547405 37.411056** at 03:46:11 **Very poor GPS data 471.50 mb**
03:44:05	7	Launch	315.21 -9.54 0.78 311.65 40.77 0.00 **-97.571433 37.217767**
03:54:10	7	land	967.13 16.65 67.23 256.75 2.85 -6.23 **-97.515987 37.214571**
03:47:01	8	Launch	9999.00 99.00 999.00 237.77 32.73 0.03 **-97.586431 36.952095**
03:53:13	8	land	**-97.554430 36.945358**
03:50:03	9	Launch	**-97.590590 36.683987**
04:00:03	9	land	**-97.529221 36.677473**
03:53:04	10	Launch	**-97.592689 36.416558**
04:02:57	10	land	**-97.527611 36.409451**
03:56:03	11	Launch	**-97.596710 36.144004**
04:06:33	11	land	**-97.525089 36.135710**

ARIES flight log

Flight: B284 | page 1 of

Date: 14/4/07 | Operator(s): Joss | Res: 1 | Gain A: 2 B: 2

Loc./Notes: 18/4 → 19/4 overnight HASI flight

Scans: *either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]".* ***View:*** *mirror angle.*

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
0:1325	Grnd						Started housekeeping
0:1503	Grnd	1	bo		70.92	33.65	Grnd cals.
010028	Transit	1/60	Cal	clsd	70.69	23.69	Cal
013719	Transit	1/60	Cal	clsd	70.93	31.37	
020600		1/60	Cal	clsd			CAL
020737	Run 1	600/1	clsd	Nad	70.92	30.40	5mon Nad.
21833	" "	1/60	clsd	Cal			
21806	" "	120/1	open	Zen			2mon Zen
021506	" "	120/1	clsd	Nad	70.99	31.30	2mon Nad.
021621	" "	60/1	Cal	clsd	70.71	30.68	
021737	" "	600/1	Nad	clsd	70.87	30.66	5mon Nad.
022237	" "	1/60	Cal	clsd	70.78	30.43	Cal.
22352	" "	120/1	Nad	clsd	70.93	30.36	2mon Nad
022306	" "	120/1	Zen	open	70.37	30.71	2mon Zen
022602	" "	120/1	Nad	clsd	70.89	31.33	2mon Nad.
22716	" "	60/1	Cal	clsd	71.06	30.92	Cal.
022834	" "	60/1	Nad	clsd	70.68	30.57	1mon Nad.
~~023012~~			~~Proj~~				
023256	Proj 62			open			Proj 62 Zen Hor Cal Nad Cal Hor
023452	"			open			" " "
023840	"			"			" " "
024015	"			"			" " "
024214	"			"			" " "
024413	Proj 62	1/60	Cal	clsd			Proper Cal in interrupt
024840	"		Proj	open			Restarted "Proj 62 ZHC NCH"
025049	"		"	"			" " " "
025248	"		"	"			" " "
025445	"		"	"			" 1mon @ end
025643	"		"	"			
025923	"		"	"			Restarted Proj 62. Proj 62 ZHC NCH
030130	"		Proj.	"			" "

ARIES flight log

Flight: B284 | page 2 of

Date: 18/01/07 | Operator(s): Joss | Res: L | Gain A: 2 B: 2

Loc./Notes: IASI HOUSTON NIGHT OVERPASS

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". **View:** mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments ~~2161~~ 2616
030333	Proyle2		Proj.	open	66.3	30.7	Proyle ZHCNCH
030556	" "		"	"	68.3	30.6	" " " "
030910	" "		"	"	65.09	30.64	
031010	Run2-1		Cal	Clsd	64.87	29.81	70.49°C on HBB view.
031142	Run2-1	120/1	Nad	Clsd	70.55	30.67	2 min back down
031254	" "	1/60	Cal	Clsd	70.87	30.30	Cal.
031459	Run2-2	1/60	Cal	Clsd	70.80	71.56	"
031720	" 2-3	600/1	Nad	Clsd	70.63	29.98	Started before FL280 Run start 031849
032335	" "	1/60	Cal	Clsd	70.61	30.03	Cal
032858	" "	600/1	Nad	Clsd	70.71	30.58	Nad view 5 min
32959	" "	1/60	Cal	Clsd	70.65	30.47	Cal.
033122	" "	600/1	Nad	Clsd	71.27	30.46	Nad view Sea View 033557.
033622	" "	1/60	Cal	Clsd	7072	30.52	Cal.
034104	Run3	1/60	Cal	Clsd	70.68	30.60	Cal.
034226	" "	600/1	Nad	Clsd	70.76	30.48	Nad 5 min
034727	" "	1/60	~~Cal~~	~~open~~	7070	30.56	
034830	" "	120/1	Zen	Open	70.44	30.56	2 min Zen view
035008	" "	300/1	Nad	Clsd.	7003	30.68	3 min Nad view
035309	" "	1/60	Cal	Clsd	70.69	30.33	Cal.
035429	" "	600/1	Nad	Clsd	70.62	30.33	Nadir 5 min
035927	" "	1/60	Cal	Clsd	7080	30.65	Cal
040631	Proyle 3			open			Proyle ZHCNCH
040854	" "			"			" " " "
041054	" "			"	63.74	31.06	" " " "
041334	" "						
041514	" "			"	61.09	31.42	
041723	" "			"	62.65	31.39	
041948	" "			"	64.05	30.36	
042453	Run4	1/60	Cal	Clsd	7072	30.32	Cal
042641	" "	300/1	Zen	open	70.47	30.48	2-5 min Zenith
042914	" "	300/1	Nad	Clsd	71.01	30.50	2-5 min Nadir

ARIES flight log

Flight: 13284 | page 3 of

Date: 18/04/07 | Operator(s): Joss | Res: 1 | Gain A: 2 B: 2

Loc./Notes: tAS1 Houston night overpass.

Scans: *either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]".* ***View:*** *mirror angle.*

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
043191	Run 4	1/60	Cal	Clsd	70.65	31.03	
043309	Run 4	300/1	Zen	open	70.21	30.62	
043548	"	300/1	Nad	Clsd	70.95	31.01	
043822	"	1/60	Cal	Clsd	70.61	31.30	
043951	"	300/1	Zen	open	70.36	30.85	
044233	"	300/1	Nad	Clsd	70.87	30.45	
044516	"	1/60	Cal	Clsd	70.84	30.71	
044725	"	300/1	Zen	open	70.34	30.64	
045003	"	300/1	Nad	Clsd	70.63	31.07	
045234	"	1/60	Cal	Clsd	70.86	30.87	
		~~300/1~~	Nad				

Microwave Radiometers FLIGHT LOG	Date	18/04/07	Flight	B284	log pages	
Operator(s)	Chawn Harlow		Campaign	JIAVEX		
Departure	Ellington		Arrival	Ellington		

System start

MARSS

Visual pod inspection						•
Close 3 SSP circuit breakers						•
Close all MARSS circuit breakers						•
FERA on				at time	2218	
Temperature controller initial temps	Ch16	°C	Ch 17	°C	Ch18	°C
Temperature controller set points		54°C		58°C	-20	40°C
MARSS CPU on				at time		
Initial target temperatures	Hot	297		Cold		297
Target heating						•
*** CHECK SCAN HEAD CLEAR ***						•
Scanning on (LMD box)				at time	2219	
Scan indication		Monitor	•		Visual	•

Deimos

Close all Deimos circuit breakers	NOT OPERATED			
Turn on Deimos CPU				
*** CHECK SCAN HEAD CLEAR ***				
Start Deimos Software			at time	
Initial target temperatures	Hot		Cold	
Target heating				
Scan indication		Monitor		Visual
Weather	Cloud		Precip	
	Surface		Pressure	
	Other			

System functionality check

(after initial system warmup, approx 1 hour)

PC to DRS Time error		$t_{PC}=t_{DRS}$ +	2 sec			at time	22:50:32		
Brightness temps 'sensible'									•
Target temps	MARSS:	Hot	344.5			Cold	296.8		
	Deimos:	Hot				Cold			
Channel gains 'sensible'		Ch1 A (-)	Ch3 A (-)	Ch1 B (-)	Ch3 B (-)				
		Ch16 (40-44)	Ch17 (45-49)	Ch18 (40-44)	Ch19 (40-44)	Ch20 (44-48)			
		41.5	32.6	38.6	39.1	42.3			

Power changeover

Headset on before start			•
Listen to engine start sequence	4, 3, 2, 1.		•
LMD off (3 switches, bottom to top)			•
Exit Deimos Software (x)			
POWER CHANGEOVER			
LMD on (3 switches, top to bottom)	then pushbutton		•
Restart Deimos Software			
System running again		at time	00:25:29

Flight #	B	Date		Operator(s)		log page	2	of	2

Time	Run id	Alt/FL	*Remarks*	Sys
			Deimos not operated	
			Ch 16 OK	
			Ch 16 US after about 20 min in flight	

Wet Nephelometer Log

Flight No B284 Date 18/04/2007 Operator's name: D. Tiddeman + C. Harlow (Training) Page 1 of 1

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
01:22	Transit	24kft	12.1	0	16.9	off	?	Briefly opened water trap tube - spikes in wet nephels
01:42	"	"	12.1	0	16.9	5°	19°	Chiller on - set to 5°
0256	Profile	16kft	14.2	0	11.4	↗20°	5°	
0207	Run	4000ft	13.1	~~39.6~~	42.4	↗30°	20°	
0210	"	"	13.0	40.4	~~88~~58	↗40°	30°	
0213	"	"	13.0	40.6	78.4	↗45°	46°	
0217	"	"	13.0	47.5	89.5	↘8°	44.7	
0226	"	"	13.2	43.5	48.8	↗35°	15	
0231	~~Profile~~	~~↘~~	13.0	42.5	73.6	↘15°	34.9	
0239	"	"	10.7	8.3	34.5	↘5°	16.5	
0249	Profile	15kft	~~11.7~~	0.0	14.7	—	5.8°	Chiller off for high level work.
0405	Profile ↘	28kft	13.1	0.0	19.8	↘5°	20°	Chiller on for decent
0424	Run	4000ft	10.5	36.0	26.7	↗35°	5°	dewpnt 5° - ...
0428	"	"	10.6	36.0	59.7	↗40°	35°	
0432	"	"	10.5	39.9	77.7	↘15°	40°	
0440	"	"	10.6	39.6	44.6	↗38°	16°	
0446	"	"	10.5	39.3	75.7	↘5°	378	
0500								Chiller off

Flight: B284

KEY

- Not Fitted
- Fitted, Not Operated
- Duff Data
- Minor Problems
- OK

Thermometers
- Cabin Temperature:
- Heimann:
- Deiced Temp:
- Non-deiced Temp:

Hygrometers
- FWVS:
- General Eastern:
- Johnson Williams:
- Nevzorov:
- Total Water Probe:

Cameras
- Downward Facing:
- Forward Facing:
- Rearward Facing:
- Upward Facing:

Navigation + Aircraft
- Cruciform GPS:
- GIN Applanix:
- INU Honeywell:
- Radar Altimeter:
- RVSM IAS:
- RVSM Static Pressure:
- XR5 GPS:

Report Created 26/06/2007 15:34:14

Misc Core
- AMTG:
- AVAPS:
- Cabin Pressure:
- Fax machine:
- Printer:
- S9 Static Pressure:
- Satcom C:
- Satcom H:
- Turb Centre-Static:
- Turb Left Right:
- Turb Up-Down:
- Turb Horizontal Chk:
- Turb Vertical Chk:
- Weather Radar:

DLUs:
- DLU AERACK:
- DLU BBR Lower:
- DLU BBR Upper:
- DLU Core Chem:
- DLU Core Consoles:
- DLU Port Aft:
- DLU Port Fwd:
- DLU Stbd Fwd:

Radiometers
Lower:
- BBR (clear) Lower:
- BBR (IR) Lower:
- BBR (red) Lower:

Upper:
- BBR (clear) Upper:
- BBR (IR) Upper:
- BBR (red) Upper:

- ARIES:
- DEIMOS:
- IR Camera:
- JNO2 Lower:
- JNO2 Upper:
- JO1D Lower:
- JO1D Upper:
- MARSS:
- SHIMS Lower:
- SHIMS Upper:
- SWS:
- TAFTS:

Last Updated: 20/04/2007 17:28:42

Cloud Probes
- 2DC:
- 2DP:
- FFSSP:
- PCASP:

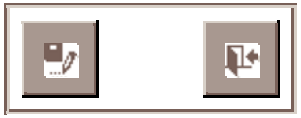
- ADA:
- CCN:
- CDP:
- CIP 100:
- CIP 25:
- CPI:
- CVI:
- SID1:
- SID2:

Aerosol
- CPC 3025A:
- Filters 47mm:
- Filters 90mm:
- Neph - Dry:
- Neph - Wet:
- PSAP:
- AMS:
- CPC 3025 (AMS):
- INC:
- VACC:
- CPC 3010A (CVI):

Chemistry
- CO Aerolaser 5002:
- NOx TE42C:
- Ozone TE49C:
- Ozone TE49:
- SO2 TE43C:
- TDLAS (NIR) CH4:
- TDLAS (NIR) CO2:

- FAGE:
- Formaldehyde:
- NOxy:
- ORAC:
- PAN:
- PERCA:
- Peroxide:
- PTRMS:
- TDLAS (1C):
- WAS Bags:
- WAS Bottles:

Misc Non-Core
- CASI/ATM:
- LIDAR:
- LTI:
- SAW Hygrometer:



Faults / Incidents Log

Flight No. B284
Date: 18 April 2007

Instruments

1. No a/c data getting to AVAPS
2. Problem with final Heiman Cal
3. No O3 data, low flows on instrument
4. Marrs channel 16
5. Satcom phone still not a big fan of the USA

Aircraft

Nil

Satcom-H Calls

Nil

Post Flight - Turb Probe Water Traps

1. Indicate Amount of Water: a) Nil b) 1-2 drops c) ¼ full or more d) Ice present
2. Emptied by:
3. Dried by:

Pre-Flighter's Log

Date: 18-APR-07 Flight No: B284 Pre-Flighter: Bob Wells

Item	√ or x	Location	Action	Comments
1	✓	Hangar	Collect Dustbin, put on a/c	
		Aircraft Cabin		
2	✓	Core Chemistry	Gases x 3 ON	
3	✓	Cabin	All Racks Checked	
4	✓	Fwd CorCon	All reqd CBs made	
5	✓	Aft CorCon	CBs made, PCs ON	
6	✓	HORACE	Optical Disk loaded	Old disk removed from drive initialled
7	✓	HORACE	Recording data	
8	✓	HORACE	DLU Status Checked	
9	✓	HORACE	HORACE Status Checked	
10	✓	Satcom H	Power LED ON	Fault report with Status
11	✓	Nevzorov	Checked and OFF	
12	✓	GPS	Checked	
13	✓	INU	Align	
14	✓	Cameras Pictures	Checked x 4 OK	
15	✓	Core Chemistry	Instruments Checked OK	
16	✓	Core Chemistry	CO Flows Checked OK	
17		FWVS	Set up	
18	X	Video x 2	Records okay, Rewind	Night Flight
19	✓	Delced Rosemount	Heater Checked / Set	
20	✓	Heimann	Calibration Checked	
21	✓	TWC	ON & Checked	
22	✓	GE	Balance checked	
23	✓	INU	Navigate then back to Align	
24	✓	Hubs x 4	Checked ON	
25	✓	Fwd Console	Miss. Sci Laptop CB made	& CB on Port Fwd SSP
26	✓	CNC	Butanol filled	AMS hoses
27	✓	CGPS	Set up	
28	✓	Miss. Sci Laptop	Checked Onboard	

External Checks overleaf →

Pre-Flighter's Log

Item	√ or x	Location	Action	Comments
		External		
29	✓	Turb Probe	Clean if reqd, Photo taken	
30	✓	JW	Cleaned & Checked	
31	✓	DI Rosemount	Cleaned & Checked	
32	✓	NDI Rosemount	Cleaned & Checked	
33	✓	Nevzorov	Cleaned/windings checked	
34	✓	GE	Cleaned & Checked	
35	✓	Lower BBRs	Domes cleaned/checked	
36	✓	Camera Windows	Cleaned	
37	✓	Heimann	Lens checked OK	
38	✓	TWC Cover	Fitted if required	
39	✓	All other covers	Removed	
40		Dustbin	Returned to hangar	
41		Tools	Check ALL in Toolkit	
42		Tools	Avalon informed	
		Avalon Checks		Signed
43	✓	Upper BBRs Checked & Cleaned		
44	✓	ICEX applied		
45	✓	Traps empty (weekly only)		

MISSING LOG SHEETS:

The following log sheets are not available for flight B284:

Log	Reason
De-brief	Sortie De-brief yet to be created by Jon Taylor
Core Chemistry	no In Flight log except in cases of instrument problems
PSAP	No log appears to have been taken for this flight
FWVS	No log is taken for this FWVS
AMS	Log only of interest to instrument operator so no copy left with FAAM

Document control

Revision	Date	Author	Comments
r0	12 Nov 2007	Doug Anderson	Initial version missing the above noted logs
r1			
r2			

VIDEO RECORDINGS:

No Digital8 video recordings were made on this flight

Dr Jonathan P. Taylor

Manager Atmospheric Radiation Research Group
Met Office
Cordouan 2 W079
FitzRoy Road
Devon
EX1 3PB
UK

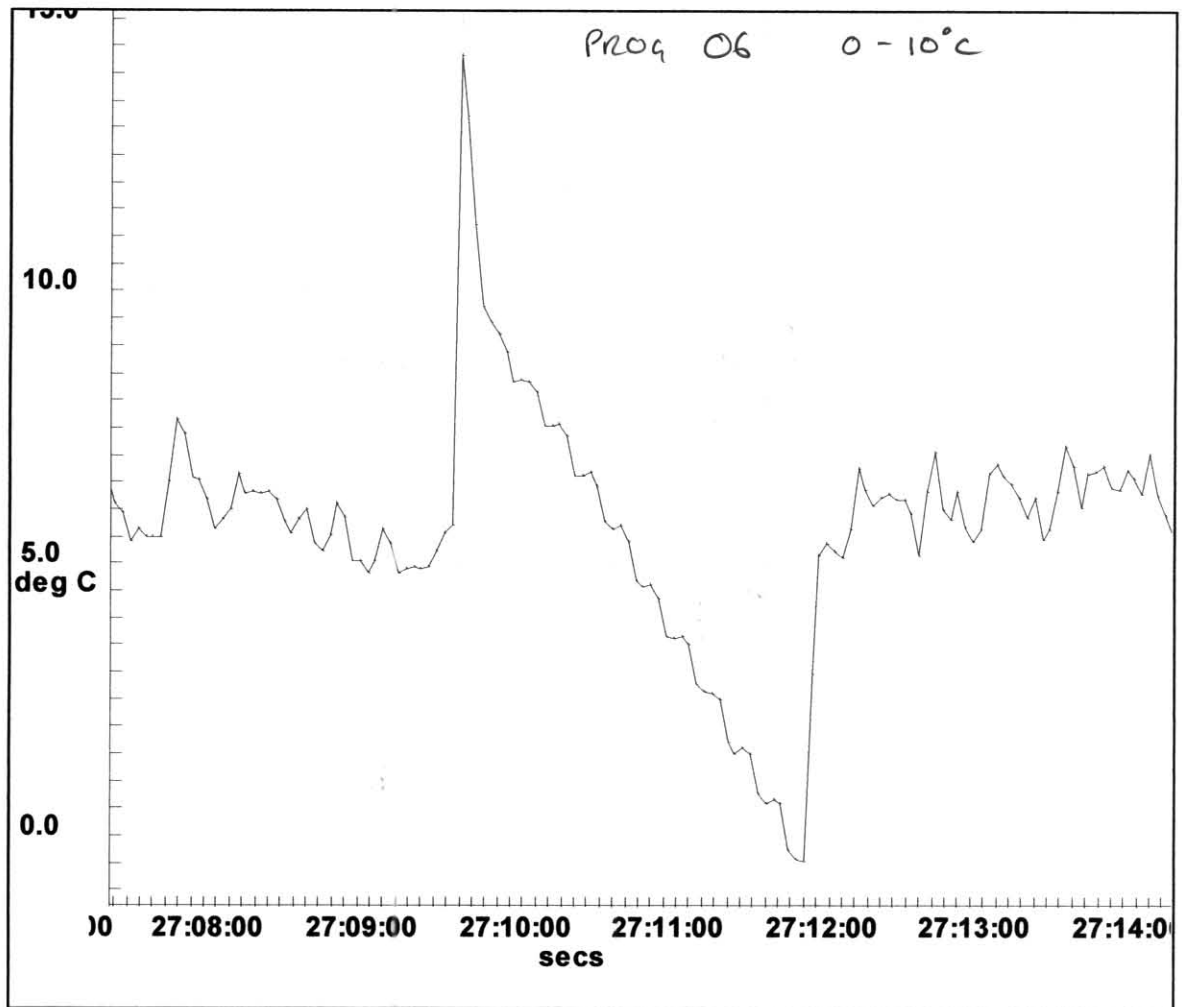
Tel: +44 (0)1392 884647
Fax: +44 (0)1392 885681

E-mail: jonathan.p.taylor@metoffice.gov.uk

New plot, same times

Flight B284 28:34:20

Heading 178 deg Speed 217 knots Height 4.0kft Press 873mb
Lat 36°54.0'NLong 97°30.0'W Wind 7 ms-1/ 152 deg
Temp 10.87C Dewpoint 5.79C
From 24:36:10 to now



Current values

TIME FROM MIDNIGHT	102858	secs	All
HEIMAN SURFACE TEMP	10.65	deg C	

New plot, same times

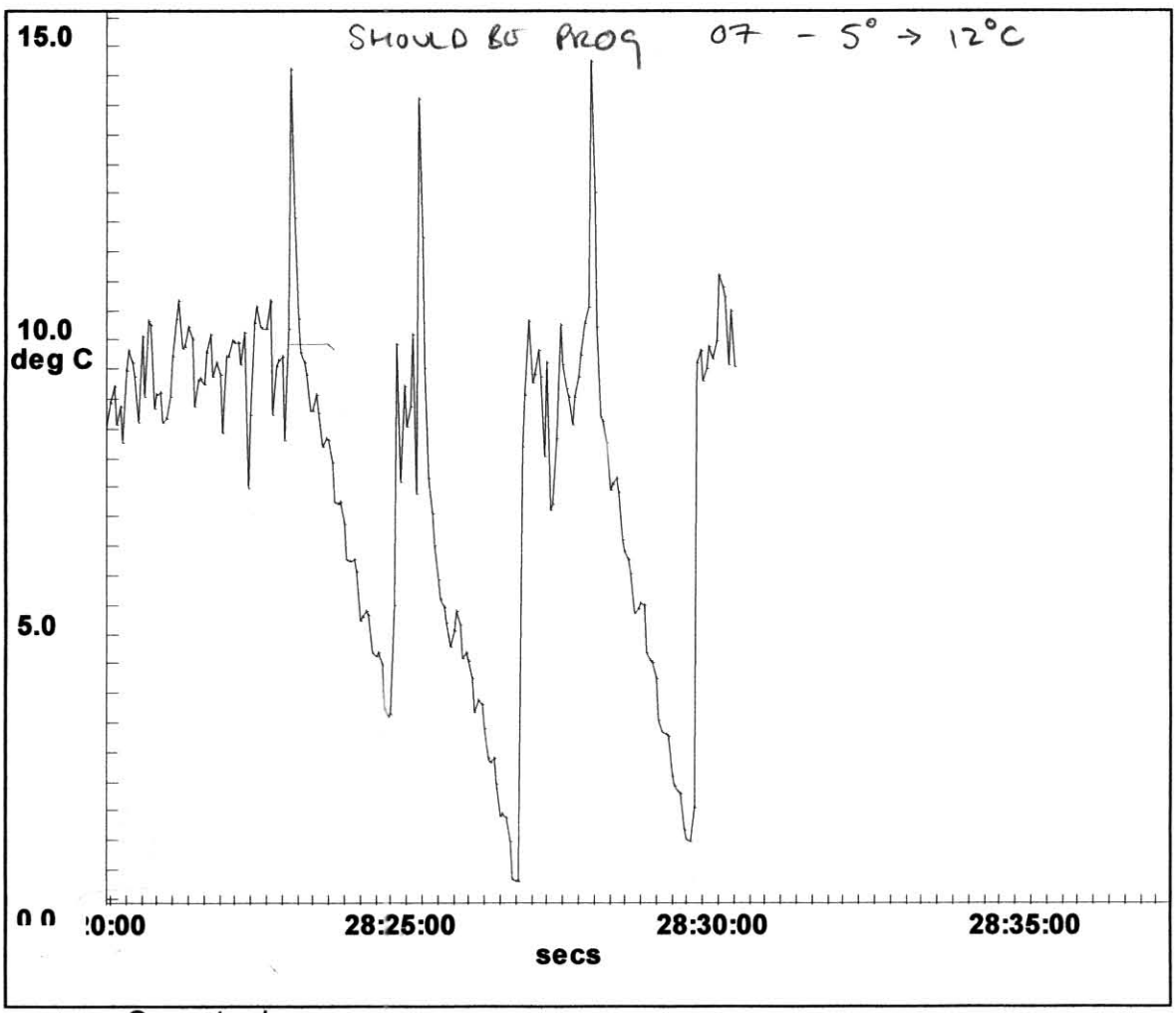
Flight B284 28:31:15

Heading 177 deg Speed 219 knots Height 4.0kft Press 873mb

Lat 37°6.0'NLong 97°30.0'W Wind 7 ms-1/ 153 deg

Temp 10.97C Dewpoint 5.72C

From 24:36:10 to now



Current values

	TIME FROM MIDNIGHT	102675	secs	All
—	HEIMAN SURFACE TEMP	9.55	deg C	

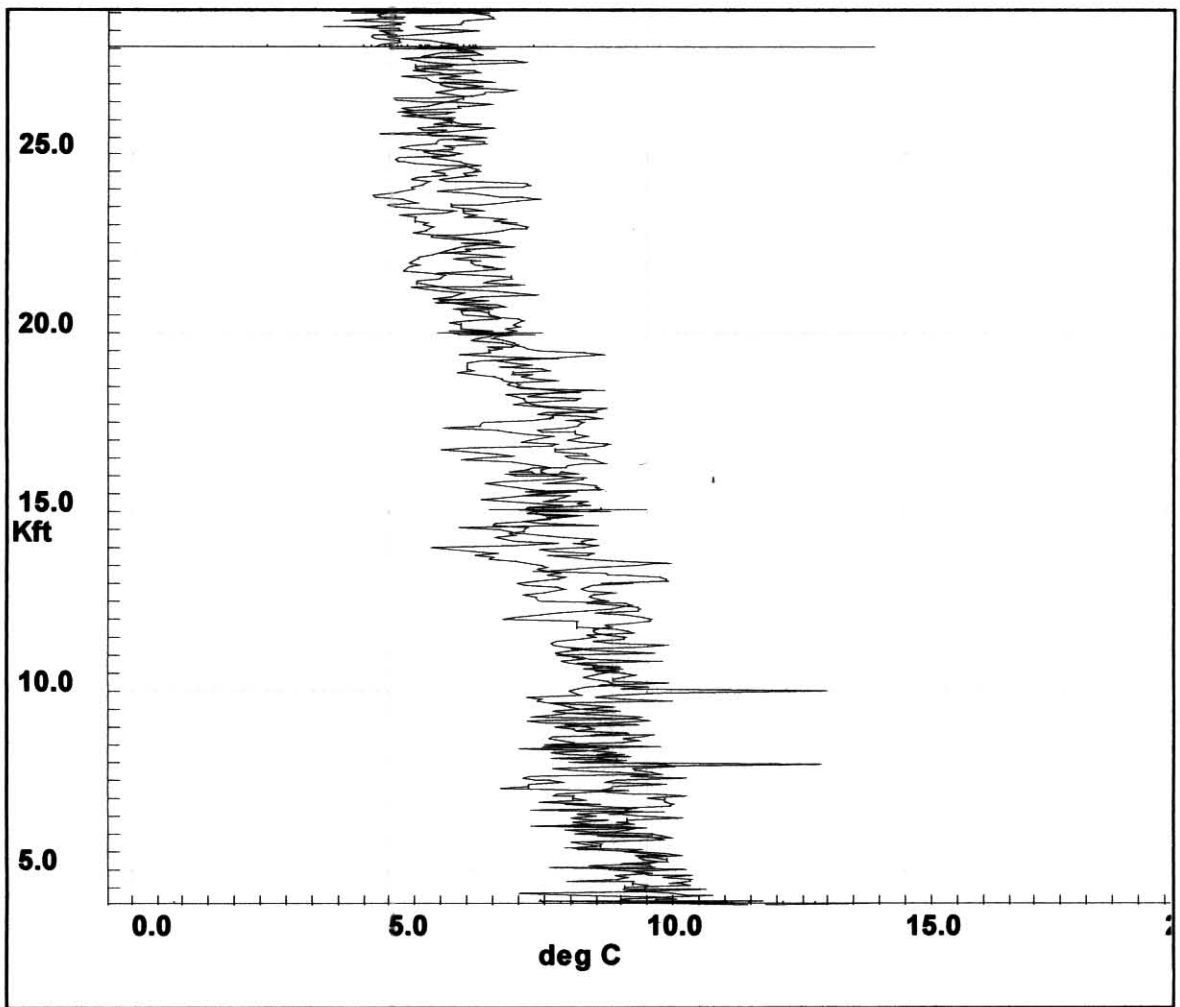
Flight B284 28:56:42

Heading 184 deg Speed 274 knots Height 8.6kft Press 733mb

Lat 35°36.0'NLong 97°36.0'W Wind 9 ms-1/ 305 deg

Temp 6.82C Dewpoint -10.76C

From 26:05:58 to 28:54:48

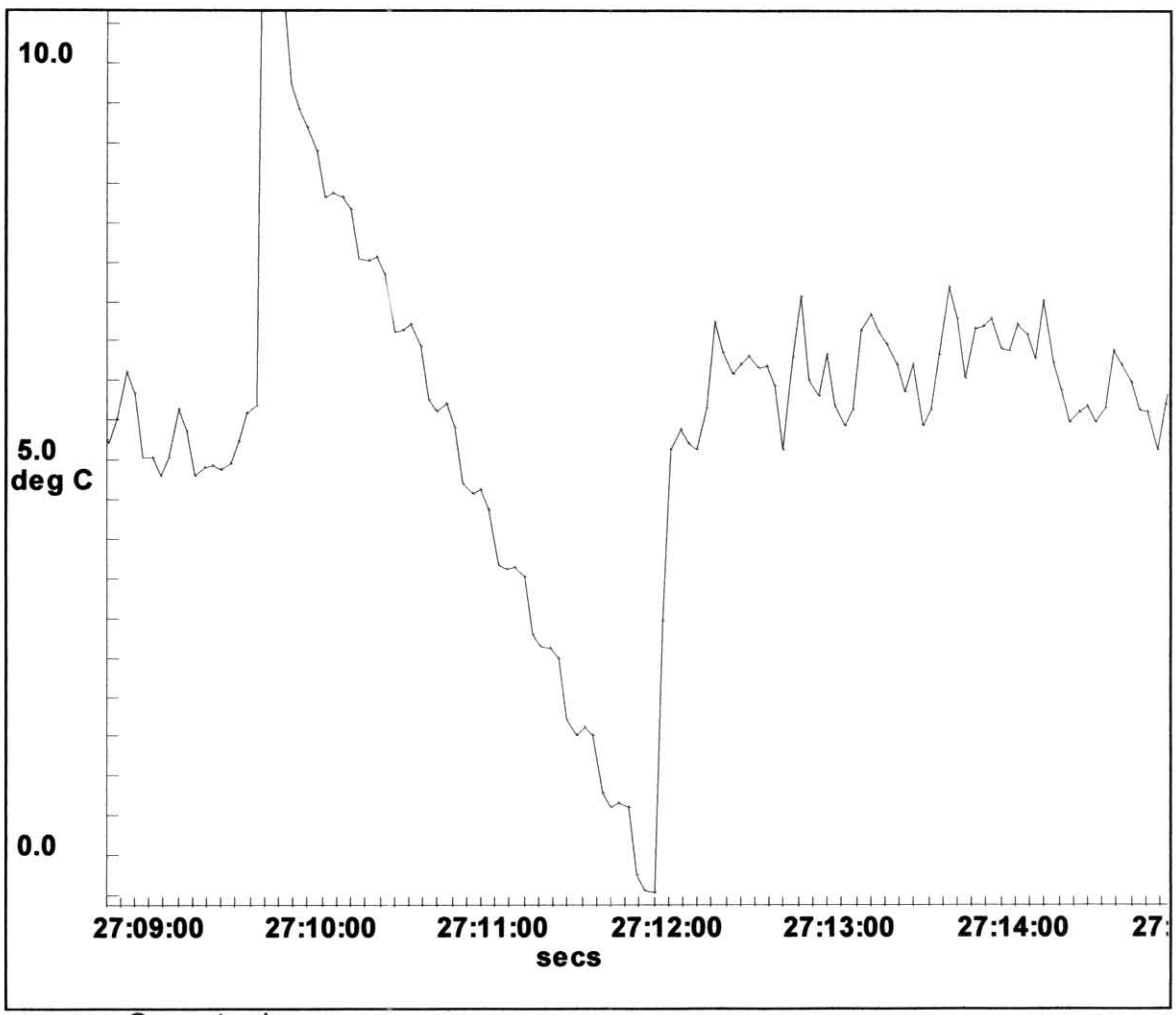


Current values			
HEIMAN SURFACE TEMP	8.31	deg C	All
PRESSURE HEIGHT	8.67	Kft	

New plot, same times

Flight B284 28:32:13

Heading 179 deg Speed 218 knots Height 4.0kft Press 873mb
Lat 37°6.0'NLong 97°30.0'W Wind 7 ms-1/ 155 deg
Temp 10.89C Dewpoint 5.97C
From 24:36:10 to now



Current values			
TIME FROM MIDNIGHT	102732	secs	All
HEIMAN SURFACE TEMP	8.6	deg C	

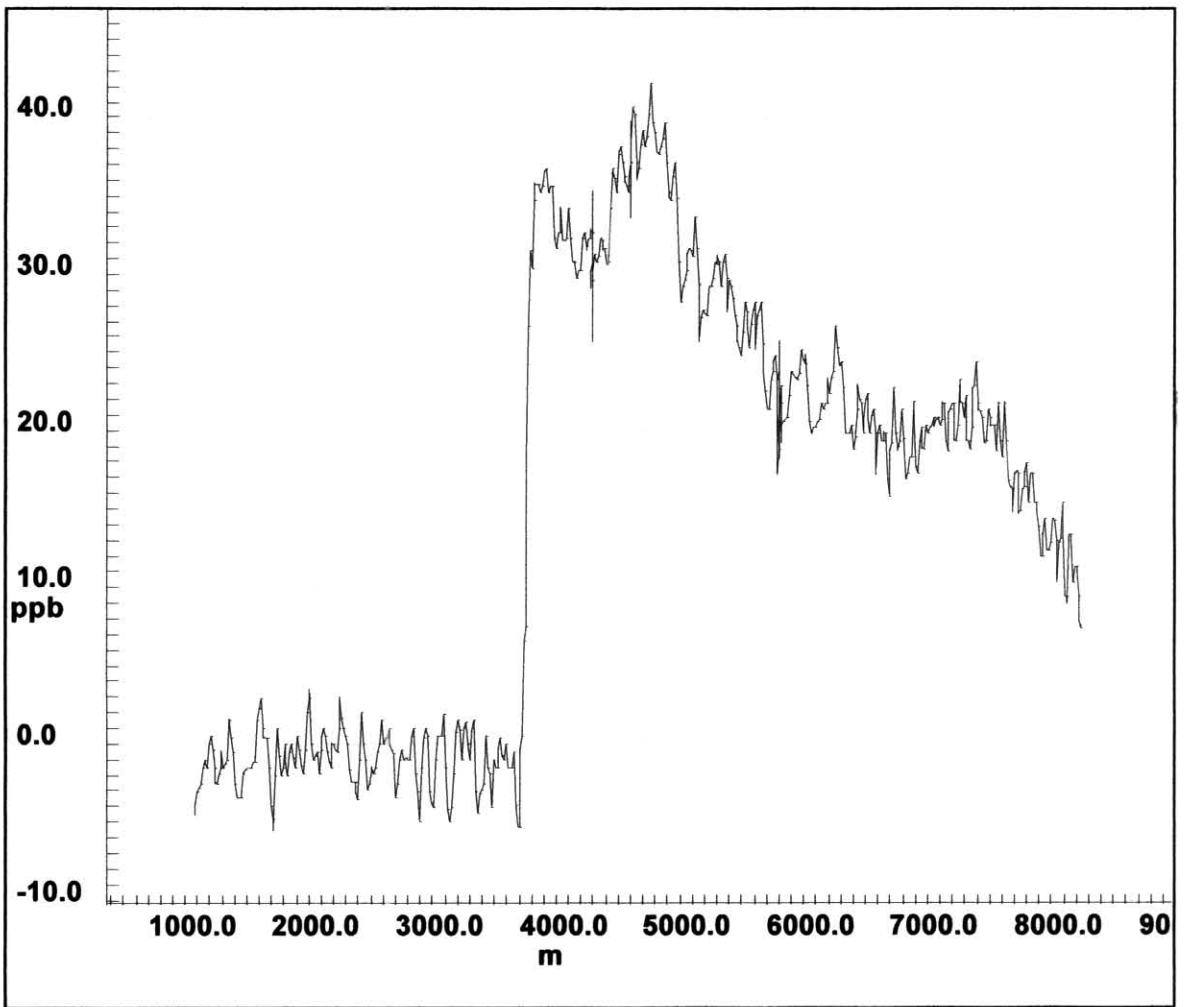
Flight B284 27:52:00

Heading 193 deg Speed 326 knots Height 29.0kft Press 314mb

Lat 36°24.0'NLong 97°36.0'W Wind 36 ms-1/ 275 deg

Temp -38.78C Dewpoint -57.84C

From 26:32:58 to 27:08:48



Current values

	PRESSURE HEIGHT	8846.07	m	◉ All
——	OZONE MIXING RATIO	10.29	ppb	○

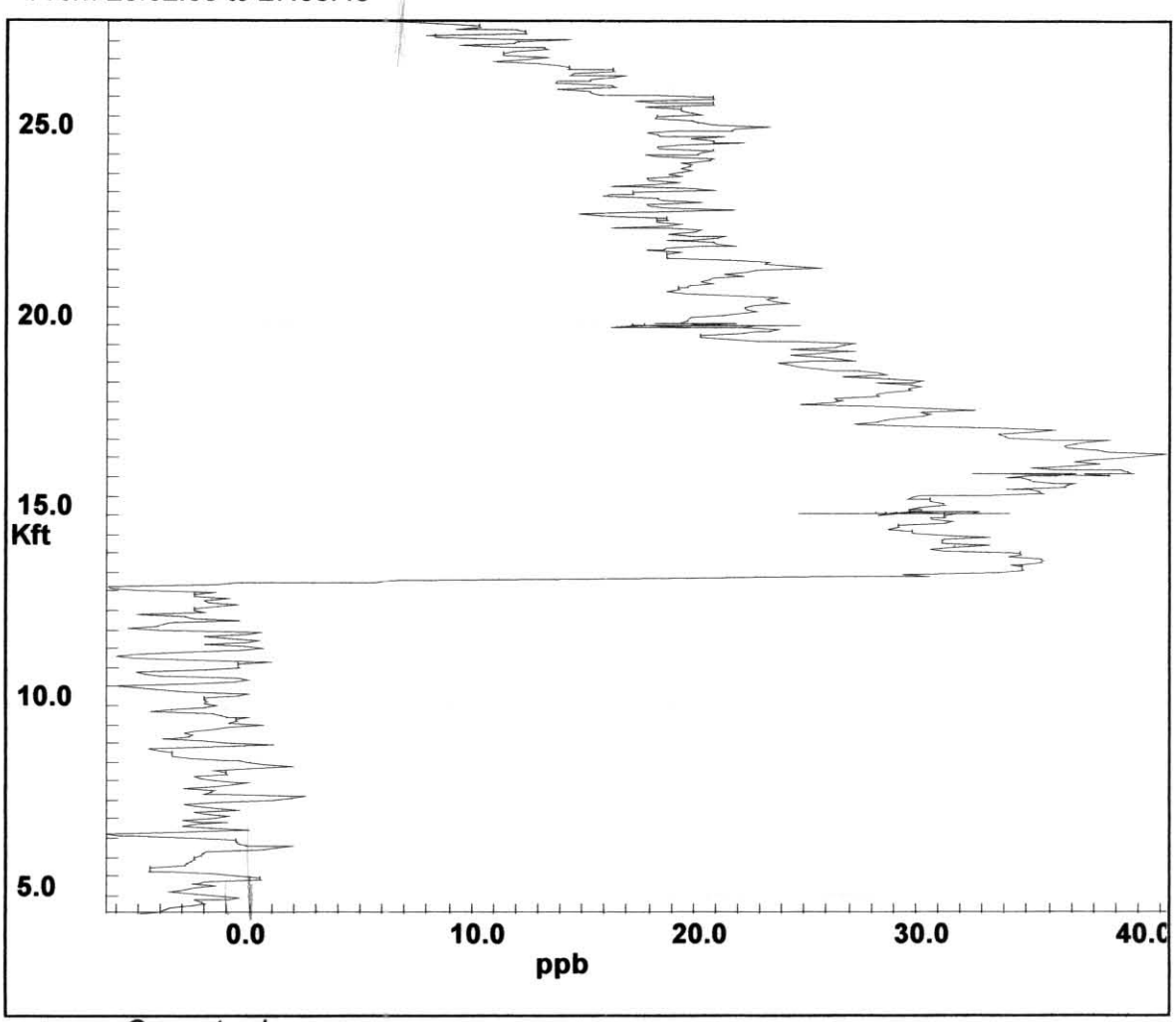
Flight B284 27:55:17

Heading 192 deg Speed 335 knots Height 29.0kft Press 314mb

Lat 36°6.0'NLong 97°36.0'W Wind 35 ms-1/ 273 deg

Temp -38.78C Dewpoint -56.9C

From 26:32:58 to 27:08:48



Current values			
OZONE MIXING RATIO	9.34	ppb	All
PRESSURE HEIGHT	29.03	Kft	

New plot, same times

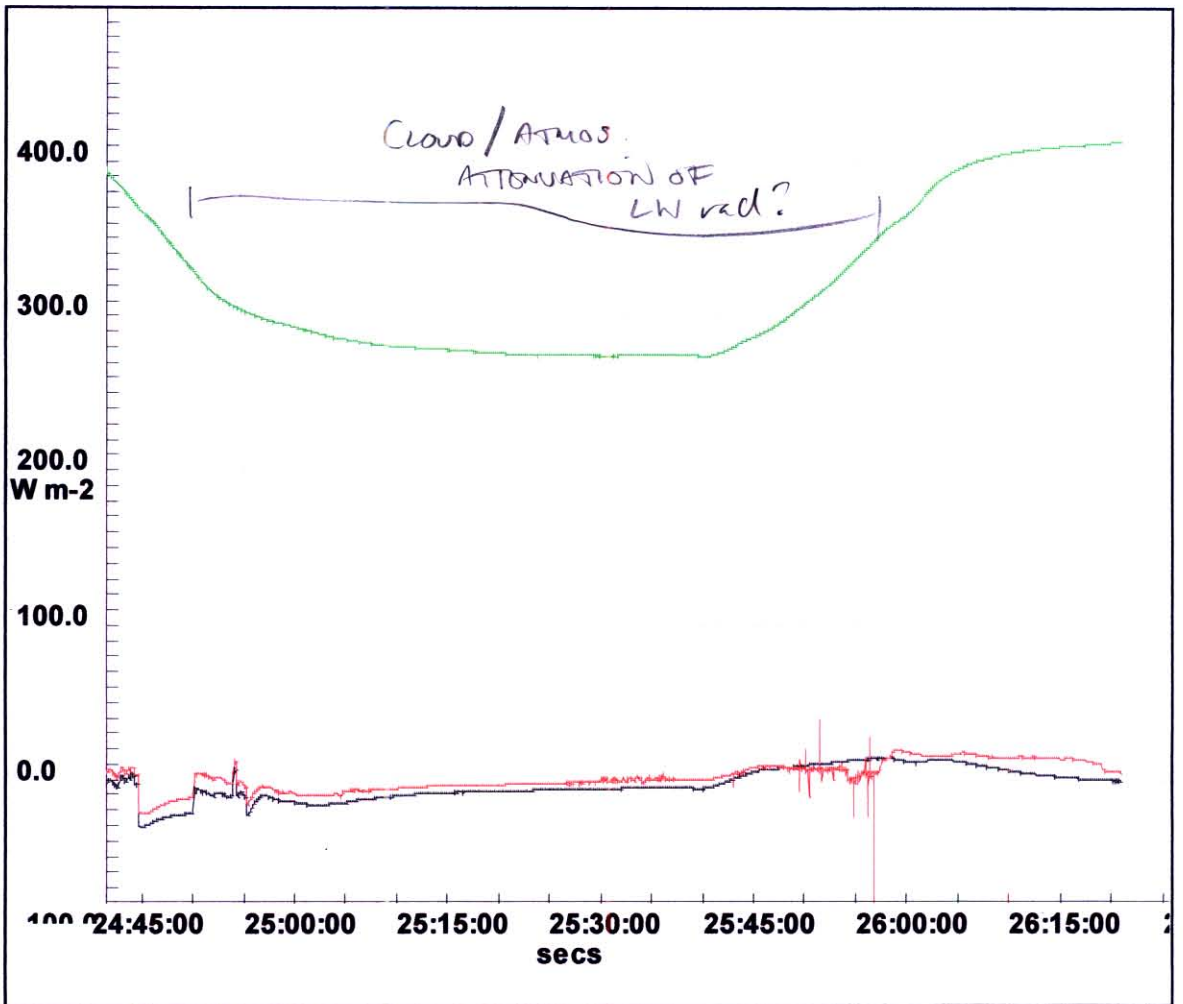
Flight B284 26:26:03

Heading 3 deg Speed 222 knots Height 4.0kft Press 873mb

Lat 37°0.0'NLong 97°30.0'W Wind 7 ms-1/ 123 deg

Temp 11.0C Dewpoint 5.78C

From 24:00:58 to now



Current values			
TIME FROM MIDNIGHT	95163	secs	All
LOWER PYRANOMETER CLEAR FLUX	-1.3	W m-2	
LOWER PYRANOMETER RED FLUX	4.12	W m-2	
LOWER PYRGEOMETER FLUX	412.12	W m-2	

New plot, same times

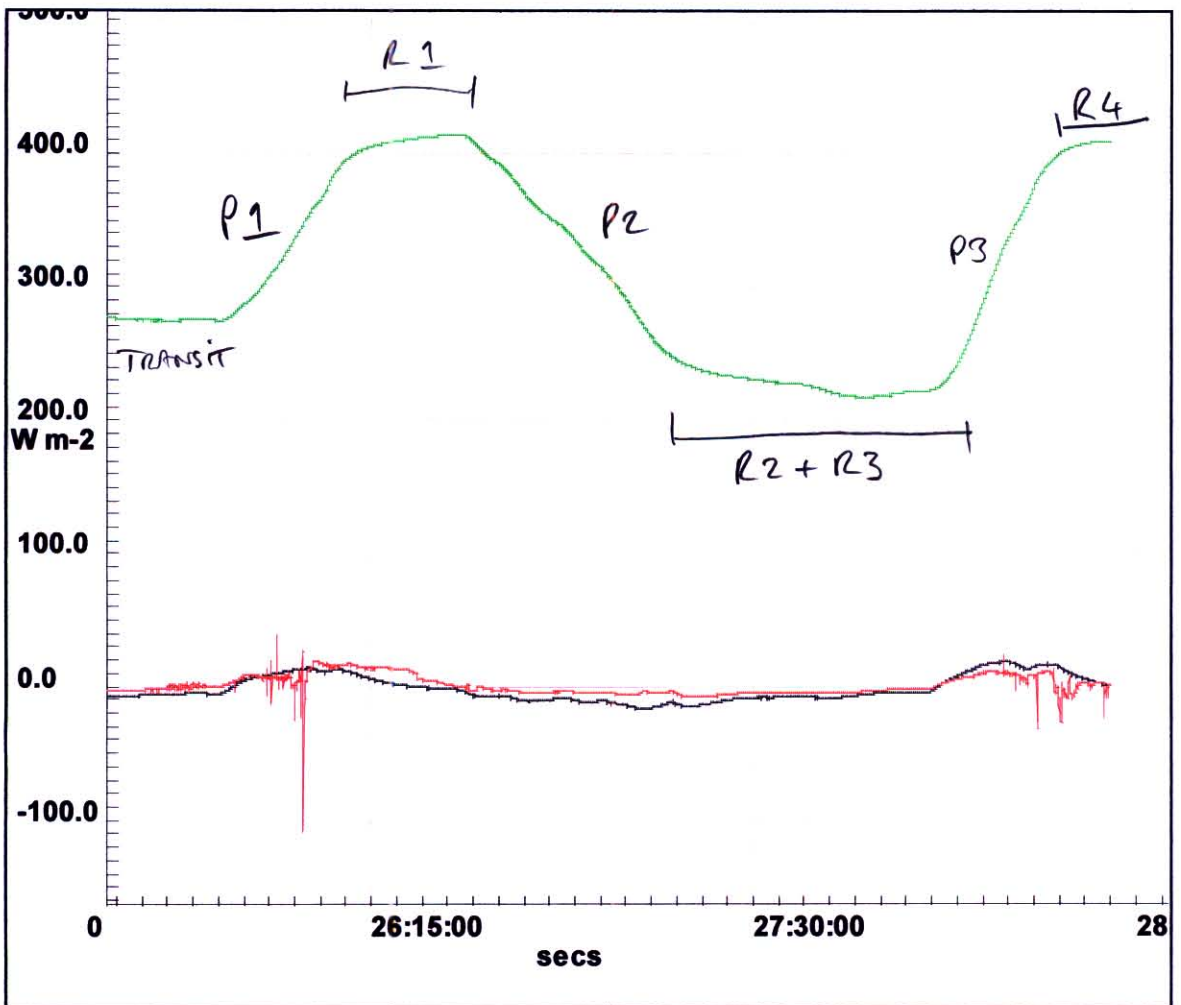
Flight B284 28:39:51

Heading 179 deg Speed 218 knots Height 4.0kft Press 873mb

Lat 36°36.0'NLong 97°30.0'W Wind 6 ms-1/ 153 deg

Temp 10.61C Dewpoint 5.49C

From 24:00:58 to now



Current values

	TIME FROM MIDNIGHT	103191	secs	All
	LOWER PYRANOMETER CLEAR FLUX	0.59	W m-2	
	LOWER PYRANOMETER RED FLUX	1.47	W m-2	
	LOWER PYRGEOMETER FLUX	409.43	W m-2	